

What is claimed is:

- 1 1. A capillary assisted loop thermosiphon apparatus comprising:
2 at least one evaporator connected by a vapor line to a condenser; a liquid line connecting
3 the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser
4 such that the condenser supplies liquid under gravity induced pressure to the evaporator, and the
5 evaporator has a vertical capillary wick in which liquid wicks in the direction of gravity.
- 1 2. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 a heat conducting capillary wick extends vertically against a heat absorbing surface on
3 the evaporator; and a vapor collection cavity extends vertically along the capillary wick, the
4 vapor collection cavity being connected to the vapor line.
- 1 3. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 a liquid line irrigator connected to the liquid line supplies liquid under gravity induced
3 pressure to a vertical heat conducting section of the capillary wick;
4 the capillary wick extends in conducting engagement along at least one heat absorbing
5 surface on the evaporator; and
6 a vertical vapor collection cavity in the heat conducting section of the capillary wick
7 extends vertically along the capillary wick, and the vapor collection cavity is connected to the
8 vapor line.
- 1 4. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends
3 along a top portion of the capillary wick to dispense liquid to the top portion of the capillary
4 wick.
- 1 5. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material.
- 1 6. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2 a liquid line irrigator connects to the liquid line, the liquid line irrigator extends along the
3 capillary wick, and a series of fluid dispensing openings in the liquid line irrigator distributes
4 working fluid along the capillary wick.

1 7. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting
3 material, and a second layer of porous sintered material on a second sheet of conducting
4 material; and

5 a liquid line irrigator is connected to the liquid line, the liquid line irrigator has both, a
6 first series of openings dispensing liquid phase working fluid on the first layer, and a second
7 series of openings dispensing liquid phase working fluid on the second layer.

1 8. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting
3 material, and a second layer of porous sintered material on a second sheet of conducting
4 material; and

5 reinforcing rods between the first layer and the second layer define a vapor collection
6 cavity therebetween; and the vapor collection cavity connects with the vapor line.

1 9. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material;
3 and
4 reinforcing rods define a vapor collection cavity along the capillary wick.

1 10. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a layer of porous sintered material on a sheet of conducting material;
3 and
4 reinforcing rods extend across a surface of the capillary wick and define a vapor
5 collection cavity along the surface.

1 11. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,

2 the vapor line connects to a first manifold having multiple outlets for connecting
3 respective vapor lines of multiple evaporators;
4 the liquid line connects to a second manifold having multiple outlets for connecting
5 respective liquid line irrigators; and
6 the respective liquid line irrigators distribute liquid to respective capillary wicks of the
7 multiple evaporators.

1 12. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the vapor line connects to a first manifold having multiple outlets for connecting
3 respective vapor lines of multiple evaporators;
4 the liquid line connects to a second manifold having multiple outlets for connecting to
5 respective liquid line irrigators for the multiple evaporators; and
6 the multiple evaporators are interconnected along their bottoms to share a common liquid
7 reservoir.

1 13. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 reinforcing rods extend lengthwise across a surface of the capillary wick and define the
3 vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection
4 cavity.

1 14. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a layer of sintered conducting material on a sheet of conducting
3 material; and
4 reinforcing rods extend lengthwise across a surface of the capillary wick and define the
5 vapor collection cavity, and prevent collapse of the capillary wick into the vapor collection
6 cavity.

1 15. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a layer of sintered conducting material on a sheet of conducting
3 material;
4 a liquid line irrigator is connected to the liquid line;
5 the liquid line irrigator extends along a top portion of the capillary wick; and

6 a series of fluid distribution openings in the liquid line irrigator supplies liquid to the
7 capillary wick. at least a pair of sheets (204) with at least one of the sheets (204) having a
8 corresponding wick portion (200) attached thereto.

1 16. The capillary assisted loop thermosiphon apparatus as in claim 1 wherein,
2 the capillary wick is a first layer of porous sintered material on a first sheet of conducting
3 material, and a second layer of porous sintered material on a second sheet of conducting
4 material;
5 reinforcing rods between the first layer and the second layer define a vapor collection
6 cavity therebetween; and the vapor collection cavity connects with the vapor line; and
7 the reinforcing rods are secured to at least one porous backing layer.

1 17. A capillary assisted loop thermosiphon apparatus comprising:
2 at least one evaporator connected by a vapor line to a condenser; a liquid line connecting
3 the condenser and the evaporator; the evaporator is in the direction of gravity from the condenser
4 such that the condenser supplies liquid under gravity induced pressure to the evaporator; and the
5 evaporator has at least a pair of sheets, with at least one of the sheets having a corresponding
6 wick portion attached thereto to provide a vertical capillary wick in which liquid wicks in the
7 direction of gravity.

1 18. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,
2 a vapor collection cavity extends vertically along the capillary wick, and the vapor
3 collection cavity is connected to the vapor line.

1 19. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,
2 a liquid line irrigator connected to the liquid line supplies liquid under gravity induced
3 pressure to a vertical heat conducting section of the capillary wick;
4 the capillary wick extends in conducting engagement along at least one heat absorbing
5 surface on the evaporator; and
6 a vapor collection cavity in the heat conducting section of the capillary wick extends
7 vertically along the capillary wick, and the vapor collection cavity is connected to the vapor line.

1 20. The capillary assisted loop thermosiphon apparatus as in claim 17 wherein,

2 a liquid line irrigator is connected to the liquid line, and the liquid line irrigator extends
3 along a top portion of the capillary wick to dispense liquid to the top portion of the capillary
4 wick.